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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/806,439

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/806,439	Applicant(s) TAKAHATA ET AL.	
	Examiner Jessee Roe	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1, 3-5 and 7-8 are pending wherein claims 1 and 4 are amended and claims 2 and 6 are canceled.

Status of Previous Rejections

The previous rejection of claims 1, 3-5 and 7-8 under 35 U.S.C. 103(a) as being unpatentable over Garcia et al. (US 4,140,555) is withdrawn in view of Applicant's amendments to claims 1 and 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Child et al. (US 3,293,030).

In regards to claim 1, Child et al. ('030) discloses a nickel-base casting alloy for turbine components with a composition relative to that of the instant invention as shown in the table on the following page (col. 1, lines 11-14 and col. 2, lines 4-17).

Element	From Instant Claims (weight percent)	Child et al. ('555) (weight percent)	Overlap (weight percent)
C	0.10 – 0.50	0.10 – 0.20	0.10 – 0.20
Si	0.06 – 1.0	< 0.2	0.06 to < 0.20
Mn	0.04 – 1.0	< 0.2	0.04 to < 0.20
Cr	5.9 – 10.	4 – 9	5.9 – 9
Al	2.0 – 8.0	2 – 8	2 – 8
Co	0 – 15.0	5 – 15	5 – 15
W	8.0 – 16.0	11 – 20	11 – 16
Ta	2.0 – 8.0	0 – 3	2 – 3
Ti	0 – 3.0	2 – 7	2 – 3
Zr	0.001 – 0.20	0.01 – 0.10	0.01 – 0.10
B	0.005 – 0.30	0.01 – 0.10	0.01 – 0.10
Ni	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, chromium, aluminum, cobalt, tungsten, tantalum, titanium, zirconium, and boron of the nickel-based alloy of Child et al. ('030) overlaps the composition of the instant invention, which would be *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the desired amounts of carbon, silicon, manganese, chromium, aluminum, cobalt, tungsten, tantalum, titanium, zirconium, and boron from that of Child et al. ('030) because Child et al. ('030) discloses the same utility (nickel-base alloys) throughout the disclosed ranges.

Still regarding claim 1, Child et al. ('030) requires the presence of carbon in the nickel-based alloys but is silent to the area percentage of carbides. However, the Examiner asserts that Child et al. ('030) would have the same amount of carbides as the instant invention because Child et al. ('030) discloses substantially the same amount of carbon (0.10 - 0.20 weight percent) and substantially the same processing (casting). MPEP 2112.01 I. Child et al. ('030) is also silent with respect to the area percentage of γ/γ' eutectoid. However, the Examiner asserts that the nickel-base alloys disclosed by

Child et al. ('030) would have the claimed eutectoid area percentage because the alloys have substantially the same composition and substantially the same processing (casting). MPEP 2112.01 I.

With respect to the formulas in claim 1,
“[%Al]+[%Ti]+[%Ta], by atomic %, amounts to 12.0-15.5%” in lines 4-5 of claim 1 and
“ $M=0.717[\%Ni]+1.142[\%Cr]+2.27[\%Ti]+1.9[\%Al]+2.117[\%Nb]+1.55[\%Mo]+0.777[\%Co]+3.02[\%Hf]+2.224[\%Ta]+1.655[\%W]+2.994[\%Zr]$ ”
in lines 8-9 of claim 1, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of nickel, chromium, titanium, aluminum, cobalt, tantalum, tungsten, and zirconium from the ranges disclosed by Child et al. ('030) because Child et al. ('030) discloses the same utility (nickel-based alloys) throughout the disclosed ranges.

With respect to the nickel base alloy being "heat resistant" as in line 1 of claim 1, Child et al. ('030) discloses that the alloy would operate at elevated temperatures (col. 1, lines 11-13). Therefore, the nickel-base alloy of Child et al. ('030) would be resistant to heat.

With respect to the recitation “wherein the contents of the impurities are regulated to be up to the following respective upper limits: Fe: 5.0%, Mo: 1.0%, Cu:0.3%, P:0.03%, S:0.03% and V:1.0%” in claim 3, Child et al. ('030) discloses less than 1 weight percent iron and an upper limit of 8 weight percent molybdenum (col. 2, lines 1-42). Although Child et al. ('030) does not specify regulating the contents of impurities such as copper to 0.3 weight percent, phosphorus to 0.03 weight percent, sulfur to 0.03 weight percent, and vanadium to 1 weight percent, because Child et al. ('030) discloses substantially the same processing (casting) and making turbine components, these impurity levels would be expected. MPEP 2112.01 I.

Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Child et al. (US 3,293,030) with evidence from Chandley (US 3,312,449).

In regards to claims 5 and 7, Child et al. ('030) discloses a nickel-base casting alloy for turbine components as described above wherein by using the compositions disclosed by Child et al. ('030), a significant increase in creep rupture strength results. However, Child et al. ('030) does not specify that the nickel-base casting alloy would be used for a turbine wheel.

Chandley ('449) discloses cast nickel-chromium alloys having substantially the same composition as that of Child et al. ('030) would be suitable for turbine wheels and alloys used for turbine wheels must have satisfactory creep characteristics at elevated temperatures (col. 1, lines 15 – 25 and claim 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the

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time the invention was made to use the nickel-base casting alloy for turbine components, as disclosed by Child et al. ('030), to form the turbine wheel, as disclosed by Chandley ('449) because Chandley ('449) requires satisfactory creep characteristics for turbine wheels and Child et al. ('030) discloses nickel-base compositions that have a significant increase in creep rupture strength due to regulation of the elements in the nickel-base alloy composition (col. 1, lines 15-25 and claim 6).

With respect to the recitation "for automobile engines" in line 1 of claims 5 and 7, the Examiner notes that this recitation would not further limit the structure of the turbine wheel. Therefore, this recitation has been considered an intended use of the turbine wheel.

Claims 1, 3-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baldwin (US 3,869,284).

In regards to claims 1, 4-5 and 7-8, Baldwin ('284) discloses a nickel-base casting alloy for turbine components such as turbine wheels with a composition relative to that of the instant invention as shown in the table below (col. 1, lines 4-10, Table I and col. 5, lines 45-52).

Element	From Instant Claims (weight percent)	Baldwin ('284) (weight percent)	Overlap (weight percent)
C	0.10 – 0.50	0 – 0.35	0.10 – 0.35
Si	0.06 – 1.0	< 0.5	0.06 to < 0.50
Mn	0.04 – 1.0	< 0.5	0.04 to < 0.50
Cr	5.9 – 10.	5 – 22	5.9 – 9
Al	2.0 – 8.0	0.2 – 8	2 – 8
Co	0 – 15.0	0 – 20	0 – 15
W	8.0 – 16.0	0 – 20	8 – 16
Ta	2.0 – 8.0	0 – 10	2 – 8

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Element	From Instant Claims (weight percent)	Baldwin ('284) (weight percent)	Overlap (weight percent)
Ti	0 – 3.0	0.5 – 7	0.5 – 3
Zr	0.001 – 0.20	0 – 1	0.001 – 0.20
B	0.005 – 0.30	0.05 – 0.30	0.05 – 0.30
Ni	balance	balance	balance

The Examiner notes that the amounts of carbon, silicon, manganese, chromium, aluminum, cobalt, tungsten, tantalum, titanium, zirconium, and boron of the nickel-based alloy of Baldwin ('284) overlaps the composition of the instant invention, which would be *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the desired amounts of carbon, silicon, manganese, chromium, aluminum, cobalt, tungsten, tantalum, titanium, zirconium, and boron from that of Baldwin ('284) because Baldwin ('284) discloses the same utility (nickel-base alloys) throughout the disclosed ranges.

Still regarding claims 1 and 4, Baldwin ('284) discloses the presence of carbides in nickel-base alloys and although Baldwin ('284) does not specify the carbide content, Baldwin ('284) teaches that the carbides would effect the rupture strength at high temperatures. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the quantity of carbides to achieve the desired rupture strength at high temperatures. MPEP 2144.05 II. Baldwin ('284) is also silent with respect to the area percentage of γ/γ' eutectoid. However, the Examiner asserts that the nickel-base alloys disclosed by Baldwin ('284) would have the claimed eutectoid area percentage because the alloys have substantially the same composition and substantially the same processing (casting). MPEP 2112.01 I.

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With respect to the formulas in claims 1 and 4,

"[%Al]+[%Ti]+[%Ta], by atomic %, amounts to 12.0-15.5%" in lines 4-5 of claim 1 and lines 5-6 of claim 4 and

" $M = 0.717[\%Ni] + 1.142[\%Cr] + 2.27[\%Ti] + 1.9[\%Al] + 2.117[\%Nb] + 1.55[\%Mo] + 0.777[\%Co] + 3.02[\%Hf] + 2.224[\%Ta] + 1.655[\%W] + 2.994[\%Zr]$ "

in lines 8-9 of claim 1 and lines 9-10 of claim 4, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Saklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of nickel, chromium, titanium, aluminum, cobalt, tantalum, tungsten, and zirconium from the ranges disclosed by Baldwin ('284) because Baldwin ('284) discloses the same utility (nickel-based alloys) throughout the disclosed ranges.

In regards to claim 3 and lines 11-12 of claim 4, Baldwin ('284) discloses not more than 2 weight percent iron, not more than 0.50 weight percent copper, and not more than 0.20 weight percent of sulfur and phosphorus (col. 5, lines 45-52), which overlaps the instantly claimed ranges of iron (maximum 5 weight percent), copper (maximum 0.3 weight percent), phosphorus (maximum 0.03 weight percent), and sulfur (maximum 0.03 weight percent). Additionally, Baldwin ('284) discloses 0 to 2 weight

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percent vanadium and 0 to 8 weight percent molybdenum (Table I), which overlaps the instantly claimed ranges of vanadium (maximum 1 weight percent) and molybdenum (maximum 1 weight percent).

Still regarding claim 4, "at least one from the group consisting of Mg: up to 0.01%, and REM: up to 0.1%" in line 4 of claim 4, Baldwin ('284) discloses magnesium impurities that should be kept as low as practical (col. 5, lines 45-52).

With respect to the recitation "for automobile engines" in line 1 of claims 5 and 7-8, the Examiner notes that this recitation would not further limit the structure of the turbine wheel. Therefore, this recitation has been considered an intended use of the turbine wheel.

With respect to the nickel base alloy being "heat resistant" as in line 1 of claims 1 and 4, Baldwin ('284) discloses that the alloy would have great tensile strength at high temperatures (col. 1, lines 4-10). Therefore, the nickel-base alloy of Baldwin ('284) would be resistant to heat.

Response to Arguments

Applicant's arguments with respect to claims 1, 3-5 and 7-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

JR